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| 09/726,801 | 11/29/2000 | Hisao Sato | P5366a | 5683 |

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EXAMINER

DASTOURI, MEHRDAD

| ART UNIT | PAPER NUMBER |
|----------|--------------|
|----------|--------------|

2623

DATE MAILED: 02/12/2004

7

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/726,801

Applicant(s)

SATO ET AL.

Examiner

Mehrdad Dastouri

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-27 is/are pending in the application.
- 4a) Of the above claim(s) ____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-27 is/are rejected.
- 7) ☐ Claim(s) ____ is/are objected to.
- 8) ☐ Claim(s) ____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 29 November 2000 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. §§ 119 and 120

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 13) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.
- a) ☐ The translation of the foreign language provisional application has been received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s). ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1-27 are rejected under 35 U.S.C. 102(e) as being anticipated by Lin (U.S. 6,272,245).

Regarding Claim 1, Lin discloses a method of identifying a target pattern in an image, said method comprising:

a) establishing an inventory of characteristic pattern points within said target pattern and establishing a first record of relative distances between selected characteristic pattern points, said relative distances being recorded as the square of actual distances between said selected characteristic pattern points (Figures 3, 8 and 9; Column 2, Lines 48-58; Column 5, Lines 40-67, Column 6, Lines 1-40. Based on the fundamentals of mathematics, calculation of distance between two points includes summing the square of the difference between respective X coordinates of the two points (i.e., $(x_1-x_2)^2$) and the square of the difference between respective Y coordinates of the two points (i.e., $(y_1-y_2)^2$). The sum of $(x_1-x_2)^2$ and $(y_1-y_2)^2$ is being inherently recorded as the square of the distance between the two points prior to obtaining the square root of this value to calculate the distance between the two points.);

b) partitioning said image into a plurality of sub-image points (Figures 3, 8 and 9);

c) identifying at least two sub-image points having attributes substantially similar to a corresponding two of said characteristic pattern points (Figures 8 and 9; Column 8, Lines 57-67, Column 9, Lines 1-24);

d) calculating the distance between said identified two sub-image points and comparing said calculated square to the recorded relative distance of said corresponding two characteristic pattern points (Figures 8 and 9; Column 8, Lines 57-67, Column 9, Lines 1-24);

e) determining that said target pattern has not been identified in response to no match being found in step (d) (Figures 8 and 9; Column 8, Lines 57-67, Column 9, Lines 1-24).

Regarding Claim 2, Lin further discloses the method of Claim 1, wherein said sub-image points are distinguished by corresponding X,Y coordinates of a Cartesian plane (Figures 3, 8 and 9; Column 2, Lines 48-58). Based on the fundamentals of mathematics, calculation of distance includes summing the square of the difference between respective X coordinates of the two identified sub-image points and the square of the difference between respective Y coordinates of said two identified sub-image points.

Regarding Claim 3, Lin further discloses the method of Claim 1, wherein selected characteristic pattern points whose relative distances constituting said first record have an associated identification indicator identifying them as a recorded two-point set (Figures 8 and 9), said identified sub-image points being given the identification indicator of their correspondingly matched characteristic pattern points (Figures 3, 8 and

9; Column 2, Lines 48-58; Column 5, Lines 40-67, Column 6, Lines 1-40), and the square of the distance between said identified sub-points being calculated in step (d) only when their given identification indicator indicates that their corresponding characteristic pattern points are part of the same two-point set (Figures 3, 8 and 9; Column 2, Lines 48-58; Column 5, Lines 40-67, Column 6, Lines 1-40).

Regarding Claim 4, Lin further discloses the method of Claim 1, wherein step (a) further includes:

grouping characteristic pattern points into three-point sets defining a first angle having a characteristic pattern point at a vertex and two characteristic pattern points at side-ends of said first angle, the square of the distance between said vertex and each of the side-ends being part of said first record (Figure 9);

establishing a second record of first angle parameters proportional to a corresponding first angle within said three-point sets (Figure 9);

assigning an identification indicator to all three characteristic pattern points in each three-point set specifying which characteristic pattern point is at the vertex position and which are at either of the side-end positions of said first angle (Figure 9; Column 2, Lines 48-58; Column 9, Lines 4-24);

each first angle parameter being defined as the product of its corresponding first angle's side-lengths multiplied by the cosine of its corresponding first angle (The first angle parameter is inherently defined as " $bc \cos \alpha$ " based on the standard formula for the relationship between the sides and angles of a triangle, i.e., $a^2 = b^2 + c^2 - 2bc \cos \alpha$, wherein α is the angle between sides b and c.) .

Regarding Claim 5, Lin further discloses the method of Claim 4 wherein said identified sub-image points are given the identification indicator of their correspondingly matched characteristic pattern point, and step (d) is implemented only when said identified sub-image points correspond to a complete three-point set (Figures 3, 8 and 9; Column 2, Lines 48-58; Column 5, Lines 40-67, Column 6, Lines 1-40; Column 8, Lines 57-67, Column 9, Lines 1-24).

Regarding Claim 6, Lin further discloses the method of Claim 4 wherein said identified sub-image points are given the identification indicator of their correspondingly matched characteristic pattern points, and further including:

f) calculating a second angle parameter of a second angle defined by three identified sub-image points corresponding to a complete three-point set of characteristic pattern points, the vertex of said second angle being the sub-image point whose identification indicator corresponds to the characteristic pattern point that is the vertex of said first angle; and comparing said second angle parameter with said first angle parameter of said corresponding three-point set (Figure 9; Column 8, Lines 57-67, Column 9, Lines 1-24).

Regarding Claim 7, Lin further discloses the method of Claim 6, further including:

g) determining that said pattern has been identified in response to said second angle parameter matching said first angle parameter and the square of the distance of the side-ends of said second angle matching the square of the distance of the side-ends of said first angle (Figures 3 and 9. Based on the standard formula for the relationship between the sides and angles of a triangle, i.e., $a^2 = b^2 + c^2 - 2bc \cos \alpha$, wherein α is the

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angle between sides b and c, the square of the distance of the side-ends of the angles and angle α are the conventional parameters used in evaluating the similarity or congruence of triangles.).

Regarding Claim 8, Lin further discloses the Claim 6, wherein said sub-image points forming the side-ends of said second angle are defined by X,Y coordinates of a Cartesian plane having positional value relative to the sub-image point identified as the vertex of said second angle; said second angle parameter being defined as the sum of the product of the X coordinates and the product of the Y coordinates of said sub-image points at the side-ends of said second angle (Figures 3 and 9. Based on the standard formula for the relationship between the sides and angles of a triangle, i.e., $a^2 = b^2 + c^2 - 2bc \cos \alpha$, wherein α is the angle between sides b and c, the product "bc" include the product of the X coordinates and the product of the Y coordinates of the points at the side-ends of said second angle.).

Regarding Claim 9, Lin further discloses the method of Claim 1 wherein each sub-image point is defined as a plurality of picture elements of said image (Figures 3, 8 and 9; Column 6, Lines 41-65).

Regarding Claim 10, Lin further discloses the method of Claim 9 further including combining the image information of said plurality of picture elements in each sub-image point into a representative composite, and comparing said composite to said characteristic pattern points (Figures 3, 8 and 9; Column 6, Lines 41-65).

With regards to Claim 11, arguments analogous to those presented for Claims 1, 4 and 6 are applicable to Claim 11.

With regards to Claim 12, arguments analogous to those presented for Claim 5 are applicable to Claim 12.

With regards to Claim 13, arguments analogous to those presented for Claim 6 are applicable to Claim 13.

With regards to Claim 14, arguments analogous to those presented for Claim 8 are applicable to Claim 14.

Lin further discloses Claims 15-18 limitations (Figures 3, 8 and 9; Column 2, Lines 48-58; Column 5, Lines 40-67, Column 6, Lines 1-40; Column 8, Lines 57-67, Column 9, Lines 1-24. Comparison is based on the standard conventional theorems for similarity of triangles such as matching "angle-side-angle", "side-angle-side", "three sides" and three angles".)

With regards to Claim 19, arguments analogous to those presented for Claim 2 are applicable to Claim 19.

Claims 20-27 recite the system for implementing the methodology Claims 11-19. Accordingly, arguments analogous to those presented for Claims 11-19 are applicable to Claims 20-27.

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

4. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by Nakamura et al (U.S. 5,581,628).

Regarding Claim 1, Nakamura et al discloses a method of identifying a target pattern in an image, said method comprising:

a) establishing an inventory of characteristic pattern points within said target pattern and establishing a first record of relative distances between selected characteristic pattern points, said relative distances being recorded as the square of the actual distances between said selected characteristic pattern points (Figures 4-6, 9, and 20-22 and 35; Column 8, Lines 65-67, Column 9, Lines 1-51. Based on the fundamentals of mathematics, calculation of distance between two points includes summing the square of the difference between respective X coordinates of the two points (i.e., $(x_1-x_2)^2$) and the square of the difference between respective Y coordinates of the two points (i.e., $(y_1-y_2)^2$). The sum of $(x_1-x_2)^2$ and $(y_1-y_2)^2$ is being inherently recorded as the square of the distance between the two points prior to obtaining the square root of this value to calculate the distance between the two points.)

b) partitioning said image into a plurality of sub-image points (Figures 12-16);

c) identifying at least two sub-image points having attributes substantially similar to a corresponding two of said characteristic pattern points (Figures 7-17; Column 9, Lines 52-67, Column 10, Lines 1-62);

d) calculating the distance between said identified two sub-image points and comparing said calculated square to the recorded relative distance of said corresponding two characteristic pattern points (Figures 7-17; Column 9, Lines 52-67, Column 10, Lines 1-62);

e) determining that said target pattern has not been identified in response to no match being found in step (d) (Column 10, Lines 15-19; Column 17, Lines 24-28).

Regarding Claim 2, Nakamura et al further disclose the method of Claim 1, wherein said sub-image points are distinguished by corresponding X,Y coordinates of a Cartesian plane (Figures 4, 9, 20 and 35. Based on the geometry fundamental theorems, calculation of distance includes summing the square of the difference between respective X coordinates of the two identified sub-image points and the square of the difference between respective Y coordinates of said two identified sub-image points.).

Regarding Claim 3, Nakamura et al further disclose the method of Claim 1, wherein selected characteristic pattern points whose relative distances constituting said first record have an associated identification indicator identifying them as a recorded two-point set (Figure 4, (XS, YS), (XE, YE), (XL1, YL1), etc.), said identified sub-image points being given the identification indicator of their correspondingly matched characteristic pattern points (Figures 5 and 6), and the square of the distance between said identified sub-points being calculated in step (d) only when their given identification indicator indicates that their corresponding characteristic pattern points are part of the same two-point set (Column 9, Lines 5-67, Column 10, Lines 1-13).

Other prior art cited

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. Patent 5,216,724 to Suzuki et al;

U.S. Patent 4,131,879 to Ehart;
U.S. Patent 4,482,971 to Blazek;
U.S. Patent 5,793,901 to Matsutake et al;
U.S. Patent 4,007,440 to Kono et al.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mehrdad Dastouri whose telephone number is (703) 305-2438. The examiner can normally be reached on Monday to Friday from 8:00 a.m. to 4:30 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Amelia Au can be reached on (703) 308-6604. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9143 for regular communications and (703) 872-9306 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the technology Center Customer Service Office whose telephone number is (703) 306-0377.

MEHRDAD DASTOURI
PRIMARY EXAMINER

Mehrdad Dastouri

Mehrdad Dastouri
Primary Examiner
Group Art Unit 2623
February 9, 2004